WA105

Status and plans

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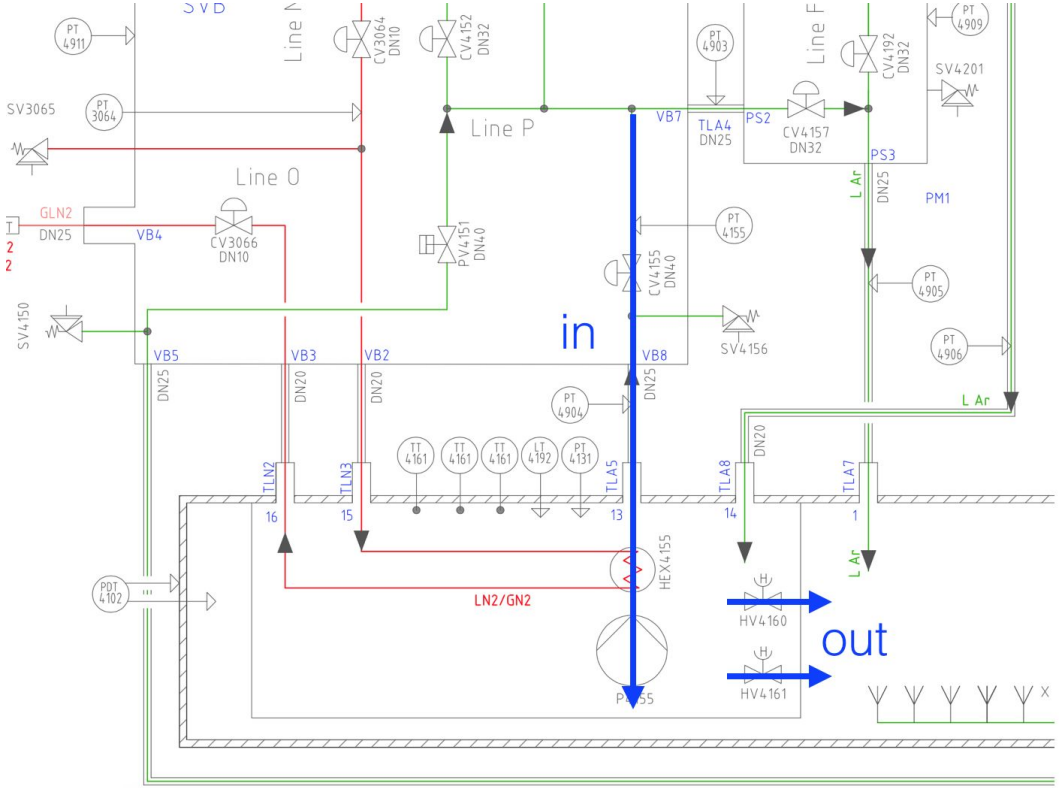
Status

- **Cryogenics:** Purge of main pipes (those external to the cryostat) performed before CERN Christmas closure.
- **Manhole successfully closed** (19/12/2016), along with all other flanges in December.
- **Purge in open loop:** On December 20th we started flushing the cryostat with GAr. We started the purge through the pump tower to evacuate the pump tower volume (10 volumes of the pump tower needed to be flushed).



First step of purge in open loop:
Flush GAr through the pump line into the vessel, in this way we remove air and impurities trapped inside. Then the gas exits the main cryostat through the 2 cryogenics valves welded onto the pump tower (HV4160 and HV4161).

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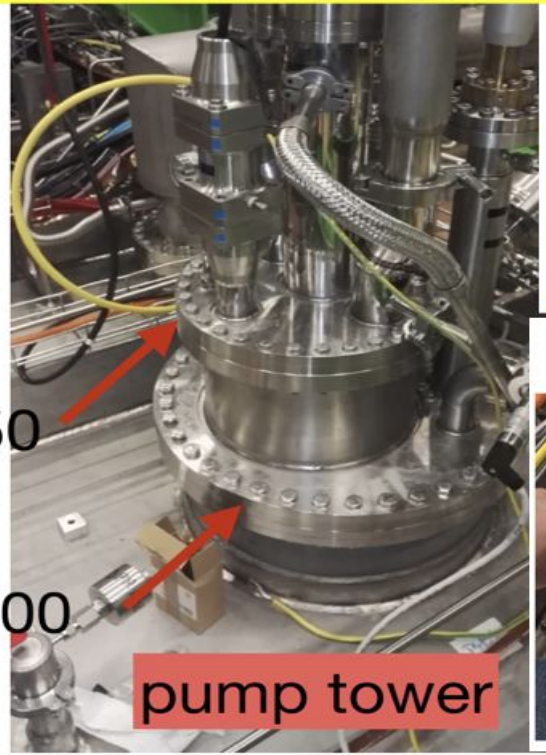
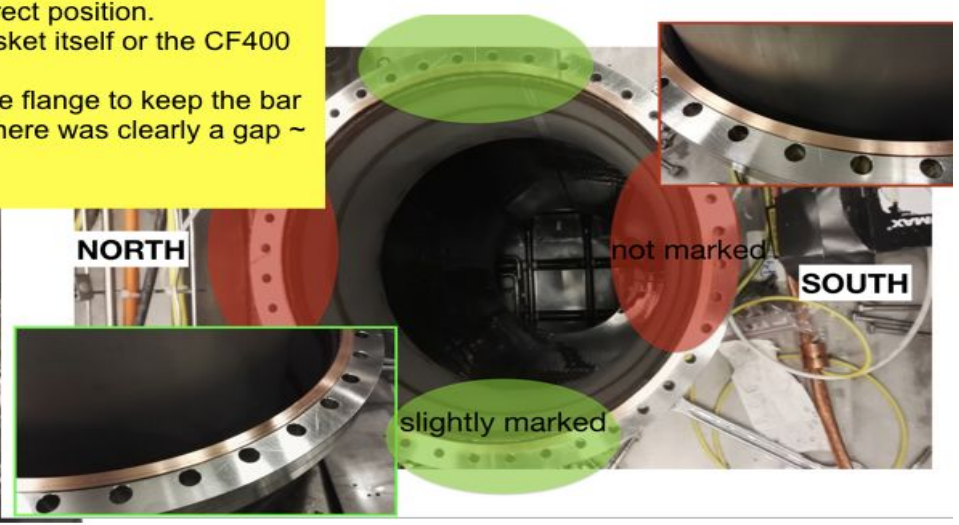
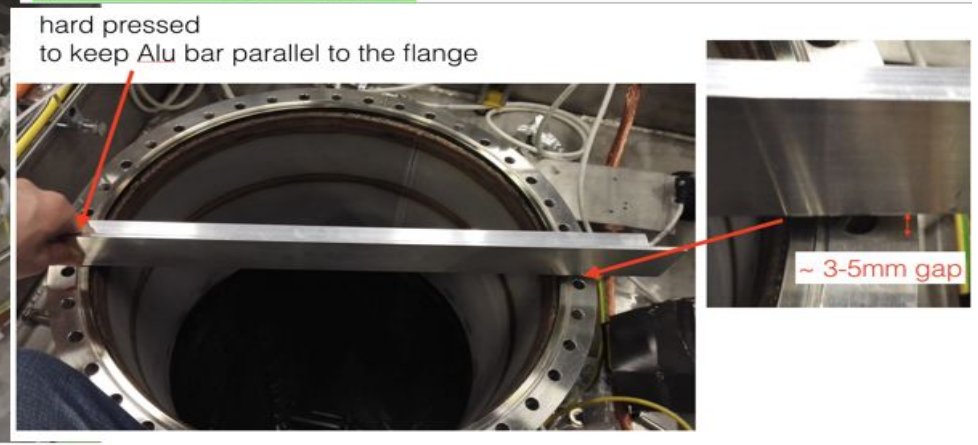
- **Purge in open loop:** On December 20th we started flushing the cryostat with GAr. We started the purge through the pump tower to evacuate the pump tower volume (10 volumes of the pump tower needed to be flushed). **Leaks coming from the pump tower were found**. Causes for these leaks were identified on December 21st and early in January 2017:
  a. A large leak at the level of the **CF250 flange** gasket. When we opened we found there was no incision on the copper gasket. We found the gasket was at the same height of the rotatable flange. We will solve the issue by putting a spacer underneath.
  b. The gasket in the **CF-400 flange** was not properly fixed because the flange was deformed (not perfectly flat and round). This has been solved by carefully screwing and positioning the gasket.

Problem reported on ELOG 66
Copper gasket slightly marked on two ends while there was no mark on the other two ends.
In addition, was difficult to keep the gasket in the correct position.
This might be due to either the deformation of the gasket itself or the CF400 flange at the top cap.
We pressed an aluminium bar tightly at one end of the flange to keep the bar parallel to the flange, on the other end of the flange there was clearly a gap ~ 3-5 mm between the bar and the flange.
This was found everywhere on the flange.

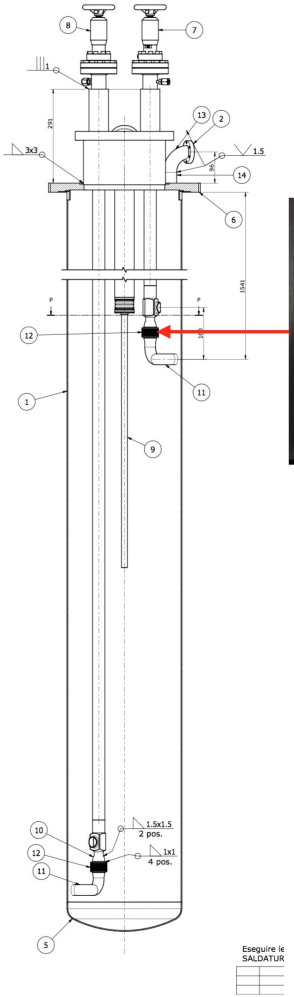




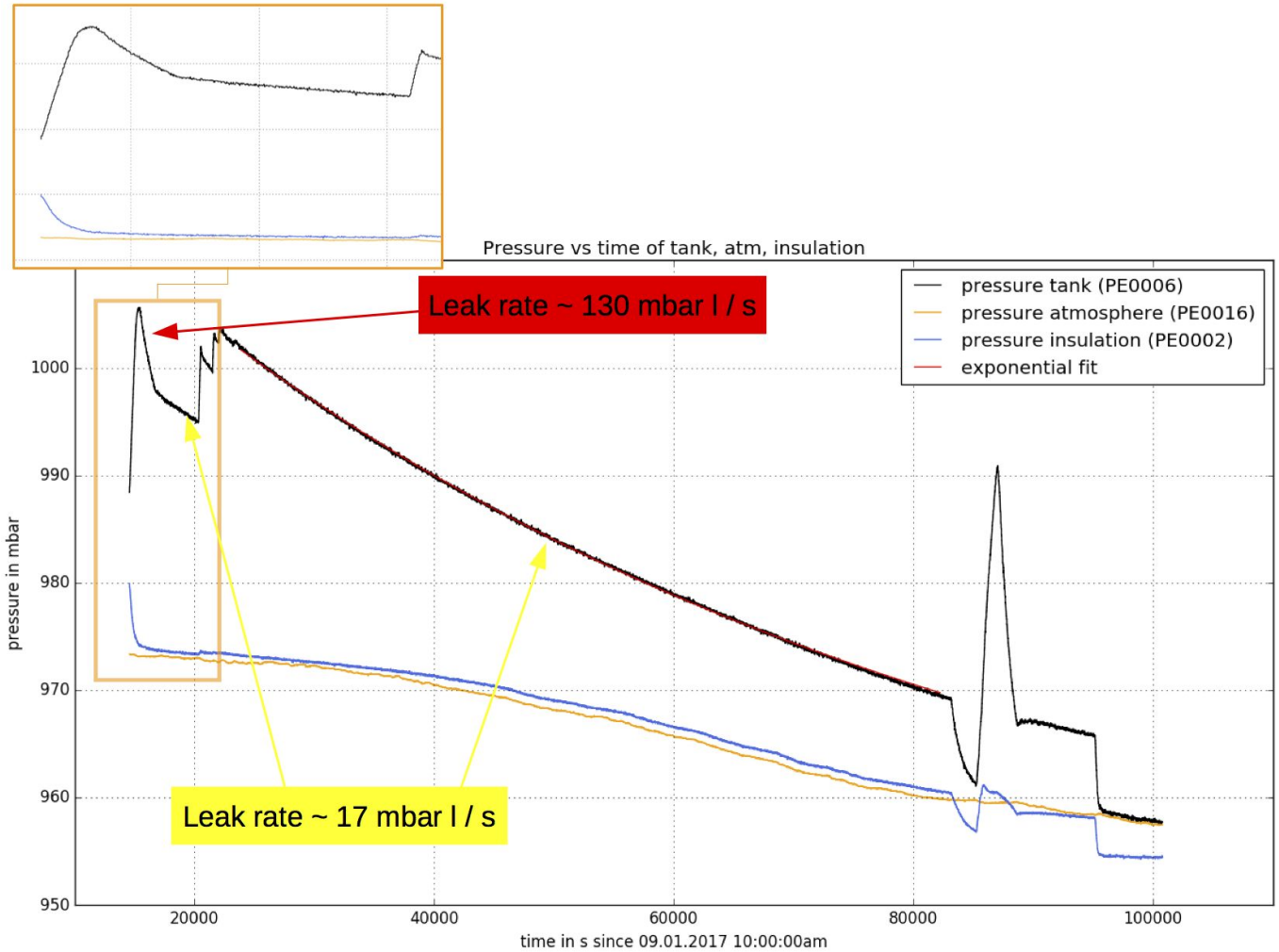


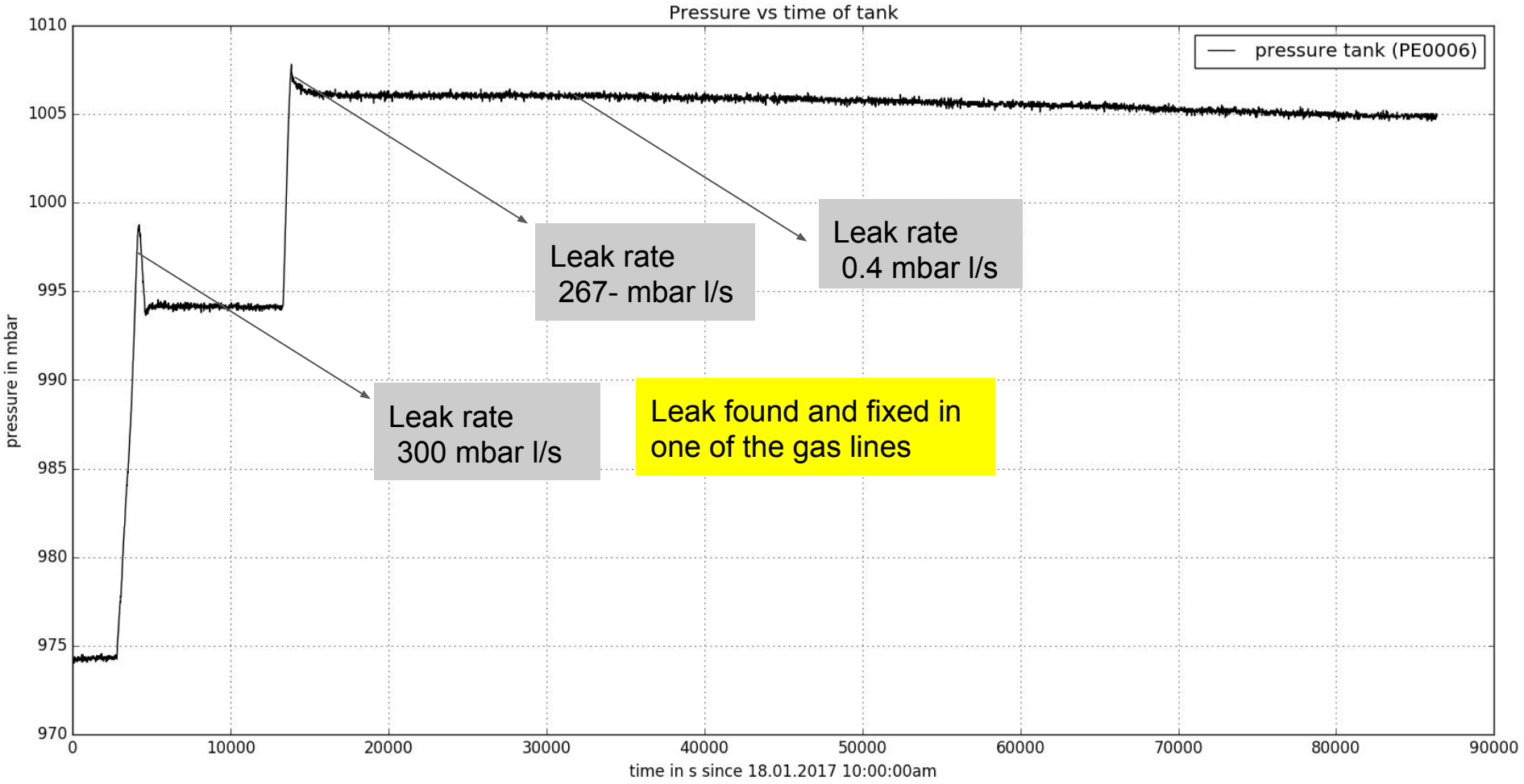
Status

- **Major leak from pump tower to main volume**: there are two manual valves which connect the pump tower to the cryostat. We realized that even when both were closed, there was gas going from the pump tower to the cryostat. By inspecting with an endoscope, we found that **one of the bellows was broken**. It might have been damaged during transport. Last week, **we dismantled the pump tower and sent it to the CERN workshop for repairing and reinforcing**. **This is now fixed**: the pump tower has already been mounted on Wednesday (17/01/2016), whereas the pump has been reinstalled now. We are now able to re-start the purge in open loop!



broken bellow

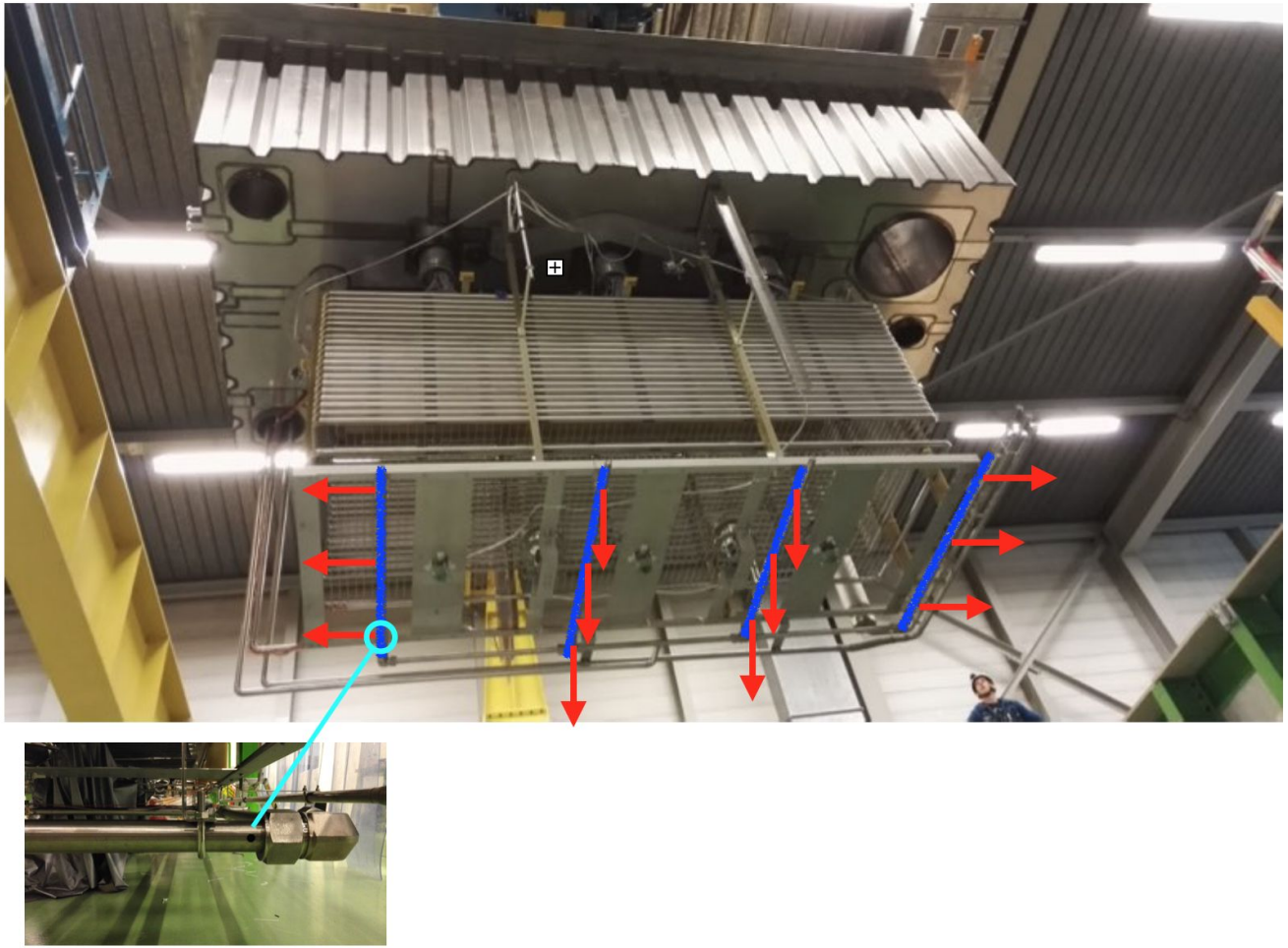

Pressure vs time of tank, atm, insulation
Leak rate ~ 130 mbar l / s
Leak rate ~ 17 mbar l / s
pressure tank (PE0006)
pressure atmosphere (PE0016)
pressure insulation (PE0002)
exponential fit
pressure in mbar
1000
990
980
970
960
950
20000
40000
60000
80000
100000
time in s since 09.01.2017 10:00:00am


Pressure vs time of tank
pressure tank (PE0006)
pressure in mbar
time in s since 18.01.2017 10:00:00am
1010
1005
1000
995
990
985
980
975
970
0
10000
20000
30000
40000
50000
60000
70000
80000
90000
Leak rate
267- mbar l/s
Leak rate
0.4 mbar l/s
Leak rate
300 mbar l/s
Leak found and fixed in
one of the gas lines

Status

Second step of purge in open loop:

Instead of using the pump tower line, we use the lines drawn in blue in the picture.
There are total 4 lines each with 3 openings of 12 mm diameter to perform the purge of the cryostat at 10g/s (or higher/lower).
These lines are below the PMTs.
The two lines on the sides are facing sidewards and the two lines in the middle are facing downwards.
This means no detector component is directly exposed to the gas while purging.



Status

- **DAQ system (Dario and Slavic will present a summary today):**
  - Successfully installed on December 2nd.
  - *Noise:* additional measurements (which add to the ones performed during summer/fall 2016) with the DAQ performed before Christmas and last week:
    i. ELOG entry summarizing measurements performed 18/10/2016-20/10/2016 http://lbnodemo.ethz.ch:2500/3x1x1/48
    ii. ELOG entry summarizing measurements performed 14/12/2016-14/12/2016: http://lbnodemo.ethz.ch:2500/3x1x1/71
    iii. ELOG entry summarizing all the runs taken during 12/01/2017 and 13/01/2017: http://lbnodemo.ethz.ch:2500/3x1x1/72
  - *Problematic channels:* We found some problematic channels and after further investigation we realised that there were some connectors badly soldered on the warm flange on SGFT3. After repairing them, the percentage of problematic channels went down from 3% to 1%.
  - *First data* is already in `EOS:/eos/experiment/wa105/data/311/calibrations`

Plans

Month	Mon	Tue	Wed	Thu	Fri	Sat	Sun
Jan	16	17	Pump tower installed 18	Pump installed 19	20	21	22
Jan	23	24	25	26	27	28	29
Jan-Feb	30	31	1	2	3	4	5
Feb	6	7	8	9	10	11	12
Feb	13	14	15	16	17	18	19
Feb	20	21	22	23	24	25	26
Feb-Mar	27	28	1	2	3	4	5

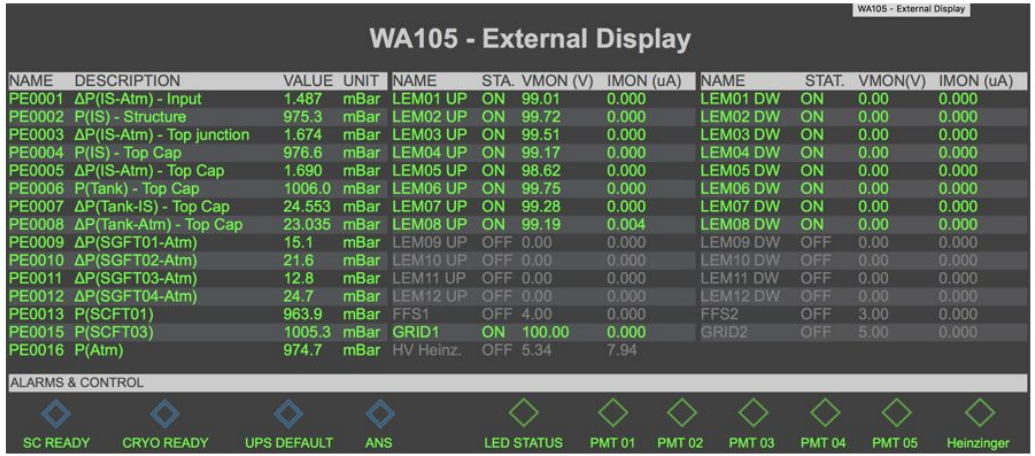
Purge in open loop

Purge in closed loop

Start cool down

Plans for next weeks

- Ongoing general high voltage tests:



A new webpage is accessible inside CERN (created by Yann): http://wa105-extdisp:3800/index.html (no login) to have a quick view of HV, pressure, LEDs...

- Test and monitor Heinzinger Power supply display ongoing.
- Once, we move to close loop:
  - Test the LEMs and monitor the leakage current.
  - Calibrate level meters.
- PMT and CRT trigger needs to be finalised.
- Display DB almost ready.